UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,571	04/25/2002	Hiroaki Kitano	KAK-004	5012

23353 7590 09/30/2008

RADER FISHMAN & GRAUER PLLC
LION BUILDING
1233 20TH STREET N.W., SUITE 501
WASHINGTON, DC 20036

EXAMINER	
FERNANDEZ RIVAS, OMAR F	
ART UNIT	PAPER NUMBER
2129	
MAIL DATE	DELIVERY MODE
09/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/018,571
Filing Date: April 25, 2002
Appellant(s): KITANO ET AL.

Brian K. Dutton
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/12/2008 appealing from the Office action mailed 3/8/2007

(1) Real Party in Interest

The real party in interest has been identified in the Appeal Brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The amendment after final rejection filed on 5/4/2007 has not been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,148,513	Koza et al.	09-1992

5,761,381 Arci et al. 6-1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 30 and 36 recite the limitation "...each of **the 2N networks**..." in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claims 30 and 36 recites the limitation "...from **the generated 2N x M** networks" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 18-39 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The computer system must set forth a practical application of judicial exception to produce a real-world result. Benson, 409 U.S. at 71-

72, 175 USPQ at 676-77. The invention is ineligible because it has not been limited to a substantial practical application.

For a claimed invention to be statutory the claimed invention must produce a useful, concrete, and tangible result. The Courts have found that subject matter that is not a practical application or use of an idea, a law of nature or a natural phenomenon is not patentable. See, e.g., *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. (20 Wall.) 498, 507 (1874) ("idea of itself is not patentable, but a new device by which it may be made practically useful is"); *Warmerman*, 33 F.3d at 1360, 31 USPQ2d at 1759.

For a claimed invention to be statutory under 35 U.S.C. 101, the claims must have the FINAL RESULT (not the steps) produce a useful (specific, substantial, AND credible), concrete (substantially repeatable/ non-unpredictable), AND tangible (real world/ non-abstract) result.

If the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended. A claim that recites a computer that solely calculates a mathematical formula is not statutory.

In the present case, claims 18-26 describe a method for operating a data processing system. The system adapts the parameters of network structures in a pool to produce network structures with a high degree of fitness to solve a given problem. The claims provide the steps performed by the system to obtain these network structures. However, the result from performing the operations in the claims is not presented to a user or provided to an outside device so as to affect its operation,

therefore no useful and tangible result is obtained from using the invention. The result produced by the invention is maintained inside the computer (not outputted), which is considered to be a manipulation of abstract ideas (not tangible).

Claims 27-39 describe subject matter similar to those of claims 18-26 and are rejected on the same basis.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18-23 and 26-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Koza et al. (US Patent #5,148,513, referred to as **Koza)**

Claims 18 and 28

Koza anticipates a method of operating a data processing system (**Koza**: C52, claim 11, L1-2), the method comprising the steps of:

providing an expression profile of a network, said network represented by triplets having a network structure (**Koza**: C7, L10-22; C16, L53-64; Examiner's Note (EN): a network is a combination of interrelated elements as described in the applications specifications on page 4, lines 15-17), parameters (**Koza**: C7, L10-16; C14, L13-34; C14, L42-50; EN: the arguments read on "parameters"), and a degree of fitness (**Koza**: abstract, L5-11; C13, L37-48; C23, L53-60; or Figs. 3A-3B); generating network

structures allowing said expression profile, said generated network structures being stored in a topology pool (**Koza**: C21, L53-59; C23, L30-36; C52, claim 10; Figs 3A-3B; EN: creating an initial population reads on storing in a topology pool. Anything created in a computer must be stored in some kind of memory if it is to be accessed for processing. data cannot be processed or manipulated in any way if it is not stored and accessible); selecting network structures from said topology pool, adapting said parameters to said selected network structures, and computing said degrees of fitness (**Koza**: C23, L30-68; C24, L1-10; C24, L53-68; C25, L1-4; or Figs. 3A-3B; EN: performing the operations on the selected entities reads on adapting parameters. A fitness is assigned to each entity in the population); storing said networks represented by triplets resulting from steps above in a triplet pool (**Koza**: C13, L37-54; C23, L30-52; C39, L4-55 or Figs. 3A-3B; EN: environmental and evolving populations are triplet pools. The populations are inherently stored in memory if they are to be retrieved for later processing); and screening candidate networks from said triplet pool, said screened candidate networks being stored in a candidate triplet pool (**Koza**: C23, L30-68; C24, L1-2; C39, lines 4-43; or Figs 3A-3B; EN: selecting entities based on fitness is screening candidate networks. The selected entities read on "candidates" and they form a candidate triplet pool).

Claim 19

Koza anticipates selecting N network structures from said topology pool (**Koza**: C23, L30-40; or Figs. 3A-3B; EN: designating a population as an evolving population read on selecting N networks from the topology pool (initial population)) and adapting M

parameter sets to each of said selected N network structures, said M parameter sets having the highest degree of fitness with said expression profile (**Koza**: C23, L53-68; C24, L1-10; or Figs. 3A-3B; EN: performing an operation on the selected entities based on highest fitness).

Claims 20, 32, 33, 38 and 39

Koza anticipates estimating parameters using a process from the group consisting of a genetic algorithm and simulated annealing (**Koza**: C24, L3-10;or Figs 3A-3B).

Claim 21

Koza anticipates reorganizing network structures of N networks in the triplet pool using a process from the group consisting of a genetic algorithm and simulated annealing (**Koza**: C24, L3-10; C24, L59-65; Figs 3A-3B; EN: performing any of these operation will alter the network structure of the selected entities); adapting parameter sets to each of said N reorganized network structures (**Koza**: C24, L3-68; C25, L1-20; EN: a genetic algorithm will adapt the parameters of the entities selected to generate a fit solution to a problem); and storing the N x M networks in said triplet pool, each of said N x M networks having one of said M parameter sets having high degrees of fitness (**Koza**: C23, L53-64; C26, L34-48; EN: by removing the entities with the lowest fitness, all of the entities in the population will have a high degree of fitness).

Claim 22

Koza anticipates selecting P triplets having degrees of fitness at or above a predetermined threshold value from among triplets in said triplet pool, left only said P

triplets in the triplet pool as a result (**Koza**: C23, L53-64; C26, L34-38; EN: by removing the entities with the lowest fitness values, only the P triplets with the highest degree of fitness will be left in the pool. Some measure must be used to determine what a low degree of fitness will be).

Claims 23, 31 and 37

Koza anticipates searching the vicinity of said selected P triplet; and replacing said searched P triplets when finding a triplet of higher degree of fitness (**Koza**: C51, L53-60; EN: selecting programs (entities) from the population based on the highest fitness).

Claim 26

Koza anticipates the structure of said generated network structure is partially known (**Koza**: C16, L53-66).

Claim 27

Koza anticipates a computer program embodied on a computer readable medium comprising: code means adapted to perform all the steps of claim 18 when said program is run on a data-processing system (**Koza**: C52, L65-68; C53; L1-47; EN: if the process is performed in a computer, code means are needed so that the computer or processor can perform its operations; processor only do what you tell them to do; they run programs).

Claims 29, 34 and 35

Koza anticipates a method of operating a data processing system which estimates candidate networks that are descriptive of relationships between interrelated

elements as a network and that, when data generated by said elements from said network is given, are "**capable of**" (as opposed to actually performing operations) reproducing data based on said data given (**Koza**: C51, claim 1): said network being represented by a triplet comprising: a network structure, a parameter set, and a degree of fitness between said data given and data reproduced from the network structure and the parameter set (**Koza**: abstract, L5-11; C7 L10-22; C8; L37-46; C10, L65-68; C13, L37-48; C14, L13-34; C16, L53-64; C23, L53-60; or Figs. 3A-3B), said method comprising the steps of:

generating a plurality of candidate networks by producing network structures based on partially known network structures, which "may allow" (or may not) for reproduction of said data given (**Koza**: C16, L53-66; C21, L53-59; C23, L30-36; C52, claim 10; or Figs 3A-3B; EN: creating an initial population is generating candidate networks which will be reproduced by the GA), producing corresponding parameter sets and degrees of fitness, optimizing said networks utilizing the degrees of fitness (**Koza**: abstract; C22, L5-58; C23, L30-52; C51, L31-68, C52, L1-13; or Figs. 3A and 3B), and storing the optimized candidate networks in a first memory means (**Koza**: e.g., abstract; C22, L5-58; C13, L29-68, C14, L1-3; C22, L3-58; or C39, L4-55; EN: each population (environmental and evolving) must be stored in different memory locations. The environmental population is stored in a first means/memory locations/range of memory addresses); and narrowing down appropriate candidate networks from said networks stored in the first memory means, using data different front said given data and that can be generated from network structures which are mutants or crossovers (**Koza**: abstract;

C22, L5-58; C13, L29-68, C14, L1-3; C22, L3-58; or Figs. 3A and 3B), and storing the networks in a second memory means (**Koza**: abstract; C22, L5-58; C13, L29-68; C14, L1-3; C22, L3-58; C39, L4-55; evolving population is stored (second memory means)).

Claims 30 and 36

Koza anticipates selecting N network structures from the produced network structures (**Koza**: C24, L3-10; C24, L59-65; Figs 3A-3B), producing N network structures from said selected N network structures (**Koza**: C24, L3-10; C24, L59-65; or Figs 3A-3B), adapting M parameter sets to each of the 2N networks utilizing degree of fitness to generate the networks (**Koza**: C24, L3-68, C25, L1-20; EN: a genetic algorithm will adapt the parameters of the entities selected to generate a fit solution to a problem), and selecting P networks of high degree of fitness from the generated 2N x M networks (**Koza**: C13, L29-54; C23, L53-64; Figs. 3A and 3B).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koza** as set forth above in view of Arci et al. (US Patent #5,761,381, referred to as **Arci**)

Claim 24

Koza does not particularly call for producing a mutant triplet for each triplet from said triplet pool, a mutant pool storing said mutant triplet; evaluating a degree of fitness with a mutant profile for said mutant pool; and integrating said degrees of fitness for said mutant pool, if a candidate group having a degree of fitness above a certain value being chosen and stored in said candidate triplet pool.

Arci teaches producing a mutant triplet for each triplet from said triplet pool, a mutant pool storing said mutant triplet; evaluating a degree of fitness with a mutant profile for said mutant pool; and integrating said degrees of fitness for said mutant pool, if a candidate group having a degree of fitness above a certain value being chosen and stored in said candidate triplet pool (**Arci**: C3, L18-42;or Fig. 2; EN: producing a set of new genotypes (mutant triplets) reads on producing (or storing in) a mutant pool. The new genotypes are assigned a fitness value and a selection process selects the best new genotypes and places them in the genotype pool).

It would have been obvious to one of ordinary skill in the arts at the time of the applicant's invention to modify the teachings of Koza by producing mutant triplets, evaluating the fitness of each mutant triplet and integrating the mutant triplet into the candidate triplet pool if its fitness is above a certain value as taught by Arci for the purpose of maintaining in the candidate pool only those triplets that have a high degree of fitness for solving a given problem.

Claim 25

Koza anticipates said mutant triplet is produced by eliminating a gene and removing all bonds from said gene (**Koza**: C52, claim 2; EN: replacing a portion (gene) of the selected program is eliminating a gene).

(10) Response to Argument

In reference to Appellant's arguments regarding the rejection of claims 30 and 36 under 35 USC § 112.

As stated above, the After Final Amendment filed on 5/4/2008 has not been entered. Therefore, the claims stand rejected as set forth in the Final Office Action of 3/8/2007.

In reference to Appellant's arguments regarding the rejection of claims 18-39 under 35 USC § 101.

On pages 10-13, the Appellant argues that the Examiner has failed to provide objective evidence showing that one of ordinary skill in the arts would reasonably doubt the utility of the claimed invention as described in claims 18-26. The Appellant also argues that a method of operating a data processing system fails to produce a real-world result.

In response, as stated in the rejection under 35 U.S.C 101 above, for a claimed invention to be statutory under 35 U.S.C. 101, the claims must have the FINAL RESULT (not the steps) produce a useful (specific, substantial, AND credible), concrete

(substantially repeatable/ non-unpredictable), AND tangible (real world/ non-abstract) result. That is, the claims must provide a tangible result, and there must be a practical application, by either: 1) transforming (physical thing) or 2) by having the FINAL RESULT (not the steps) achieve or produce a useful (specific, substantial, AND credible), concrete (substantially repeatable/non-unpredictable), AND tangible (real world/non-abstract) result. The claims fail to provide a useful result because the claimed subject matter fails to sufficiently reflect at least one practical utility set forth in the descriptive portion of the specification and a tangible result because the claimed subject matter fails to produce a result that is limited to having real world value rather than a result that may be interpreted to be abstract in nature as, for example, a thought, a computation, or manipulated data.

The claims are directed to mere abstract manipulation of abstract objects by adapting parameters of the objects. Adapting parameters of abstract objects, in and of itself, is useless in a real world situation absent a particular substantial application. The claims are not limited to a substantial practical application because they encompass manipulation of unspecified, abstract objects (since network has not been defined in the claim to encompass any non-abstract object) to produce further abstract objects which fail to represent some real world activity and which further that have no specific purpose or use. Producing abstract data is not a practical and tangible result since abstract data alone has no physical structure and does not itself perform any useful, concrete and tangible result. Without subsequent processing, this abstract data does not represent any real world activity and would not result in a practical application.

It should also be noted that the limitation of “operating a data processing system” is contained in the preamble of the claim. The body of the claim is not tied to this limitation since nothing in the claim suggests that any of the processing performed would cause any effect that changes the operation of the data processing system in any way.

On pages 13-14 the Applicant argues that the Final Office Action fails to explain why a computer program embodied on a computer readable medium, as in claim 27, is found to be non-statutory subject matter.

In response, the Examiner did not reject claims because they where directed to a computer program embodied on a computer readable medium. As stated in the rejection, claims 27-39 were rejected on the same basis as claims 18-26. That is for failing to produce a useful result because the claimed subject matter fails to sufficiently reflect at least one practical utility set forth in the descriptive portion of the specification and a tangible result because the claimed subject matter fails to produce a result that is limited to having real world value rather than a result that may be interpreted to be abstract in nature as, for example, a thought, a computation, or manipulated data. The arguments above regarding claims 18-26 apply to claims 27-39.

On pages 14-15, the Appellant argues that the Examiner has failed to explain why a network estimation apparatus is found to be non-statutory subject matter since in the broadest reasonable interpretation it "could" require the use of a computer.

In response, if it “could” require the use of a computer, then it does not **necessarily** require the use of a computer. However, the claims were not rejected on

these grounds. They were rejected on the same basis as claims 18-26, particularly for failing to produce a useful result because the claimed subject matter fails to sufficiently reflect at least one practical utility set forth in the descriptive portion of the specification and a tangible result because the claimed subject matter fails to produce a result that is limited to having real world value rather than a result that may be interpreted to be abstract in nature as, for example, a thought, a computation, or manipulated data.

In reference to Appellant's arguments regarding the rejection of claims 18-23 and 25-39 under 35 USC § 102 as being anticipated by Koza.

The Appellant argues on page 15 that the Examiner has engaged in impermissible hindsight reconstruction by using the Applicant's disclosure as a template to fill in the gaps within the teachings of Koza.

In response, the Examiner was merely reading the claims in light of the specification. The specification was used as a dictionary to identify the intent of the word "network" in the claim. If the claim is not clear as to what an element contained therein entails, where else but in the specification of the application can the Examiner rely on in order to understand the claimed invention and search for the best prior art?

On page 17, the Appellant argues:

> Yet, Koza fails to disclose, teach, or suggest screened candidate networks being stored in a candidate triplet pool.
>
> In this regard, the Office Action fails to show the presence within Koza of a topology pool, a triplet pool, and a candidate triplet pool.
>
> Thus, the claim 18 step of storing said selected network structures represented by triplets resulting from steps above in a triplet pool is absent from within Koza.

In response, the claims and only the claims form the metes and bounds of the invention. The Examiner has full latitude to interpret each claim in the broadest reasonable sense. All of the features identified by the applicant have been anticipated by relevant sections of Koza above and the reasoning made by the Examiner has been provided.

The chromosomes (entities) described in the Koza reference, each have a composition of functions (network structure), a set of elements or arguments (parameter set) and each chromosome is assigned a value based on its performance (degree of fitness) (**Koza**: C8; L37-46; C10, L65-68; C11, L1-4; C13, L29-54; C14, L13-61; C24, L59-65; C51, claim 1; C52, claim 10), thus providing the "triplets" as disclosed in the Application's specification in page 7, paragraph 52.

From applicant's specification at paragraphs 57-59, topology pool is the initial population of candidates generated. Koza anticipates such initial population at column 21, lines 53-59; column 23, lines 30-36; column 52, claim 10; Figures 3A and 3B where initial populations (topology pool) are created. Note that "pool" has not been further defined nor has it been limited to a particular structure. A person of ordinary skill in the arts would recognize a pool to be a group of objects. Clearly, creating an initial population of candidates is creating a pool of candidates, each candidate represented by triplets as discussed above. Also, it should be noted that if this initial population is created and used by the system described in Koza, it is inherent that it is stored since Koza uses a computer system. In computer system all data used must be stored in some kind of memory so that the system can retrieve the data in order to process it.

From Applicant's specification at paragraph 62, specimens or triplets are retrieved from the topology pool. Similarly Koza develops an evolving population (triplet pool) from the initial populations at column 13, lines 29-54; column 23, lines 30-52 and figures 3A and 3B.

From Applicant's specification at paragraph 62, candidate triplet pool is formed to narrow down the specimens from the triplet pool by performing mutation analysis. Similarly, Koza selects (screens) entities (specimens) from the evolving population (triplet pool) at column 23, line 30 to column 24, line 2 and Figures 3A and 3B. Moreover, from Figs 3A and 3B it can be seen that the newly created entities are **inserted** into the evolving population, therefore creating a new evolving population, or candidate triplet pool as the Appellant calls it. Moreover, in C24, L3-29, Koza teaches that groups of entities are selected to produce offsprings by using genetic operations (crossover, mutation). In the broadest reasonable sense, this group could also be considered a candidate triplet pool, since this is a group of candidates selected from the population to which an operation will be performed.

The process of storing these populations, or pools as the Applicant calls them, is taught by Koza on column 39, lines 4-55. Moreover, whenever something is created in a computer, it must be stored in some kind of memory if the computer is to perform any operation on these created objects. Therefore, if groups or populations are being created in the system of Koza and objects from these groups are being selected to opearate upon them, then they must be stored in order for the computer system to access these objects or any data that is to be processed.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Omar F. Fernández Rivas/

Examiner, Art Unit 2129

Conferees:

/David R Vincent/

Supervisory Patent Examiner, Art Unit 2129

/Joseph P. Hirl/

Primary Examiner, Art Unit 2129